TEST REPORT

Test Laboratory No. 1706 accredited ČIA according to ČSN EN ISO/IEC 17025:2018

Laboratory address and test performance site:	UNIS, a.s. Test Laboratory VTP UNIS Sochorova 3232/34 616 00 Brno – Žabovřesky Czech Republic
Headquarters:	UNIS, a.s. Jundrovská 1035/33 624 00 Brno - Komín
Customer:	Light seekers s.r.o. Stroupežnického 529/6 150 00 Praha-Smíchov
Test report ID:	U24ZKLS-ZP-001

EMC TESTS

Equipment under test:	**SC Industry A6 Controller**
Test methods:	ČSN EN 55016-2-1, ed. 3, cl. 7 ČSN EN 55016-2-3, ed. 4, cl. 7.3 a 7.6 ČSN EN IEC 61000-6-3, ed. 3 ČSN EN IEC 61000-4-3, ed. 4 ČSN EN 61000-4-4, ed. 3 ČSN EN 61000-4-5, ed. 3 ČSN EN 61000-4-6, ed. 5 ČSN EN IEC 610006-11, ed. 3 ČSN EN IEC 61547, ed. 3* * Standard is not within the scope of accreditation
Sample arrival date:	8 November 2024
Test performance date:	11 November 2024 – 13 November 2024
Test report issue date:	3 December 2024
Test report created by:	Václav Šádek Test Engineer
Test report approved by:	Petr Kalvoda Deputy Head of Laboratory

1. Distribution List

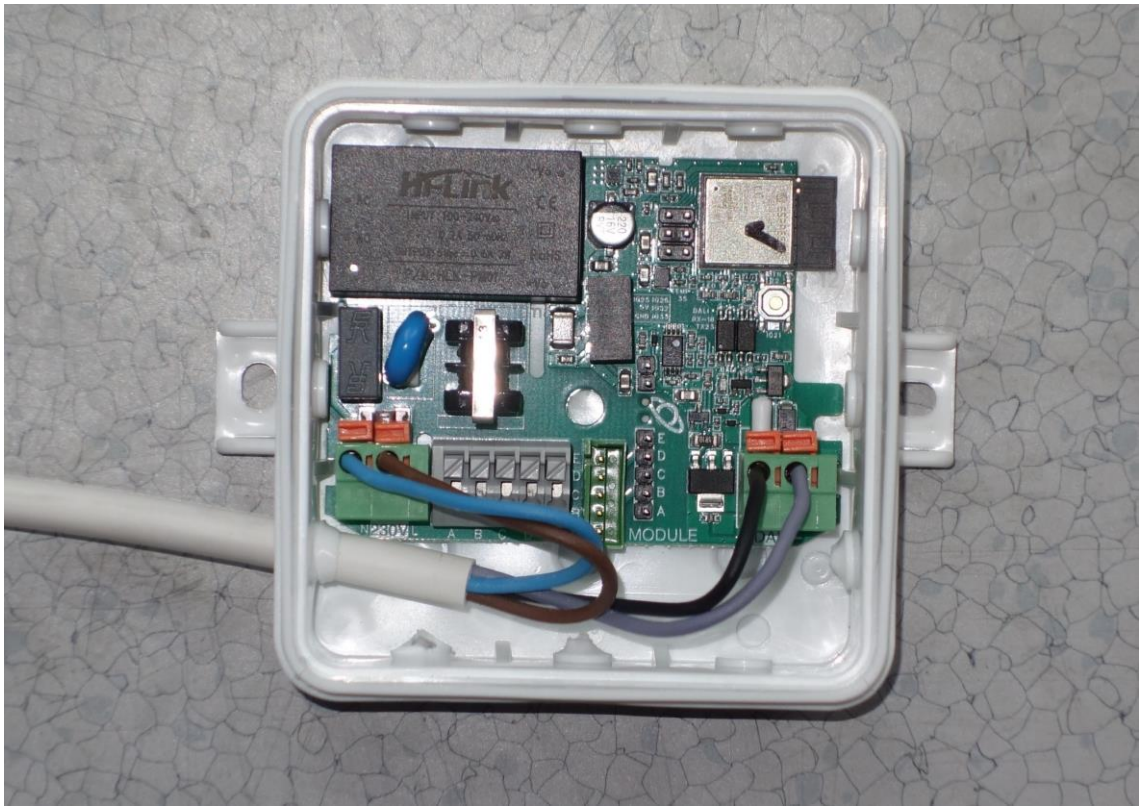
Issue # 1 Light seekers s.r.o.
Issue # 2 UNIS, a.s.

2. External Persons Present

Name:	Company:
Juraj Repčík	Light seekers s.r.o.

3. EUT Identification

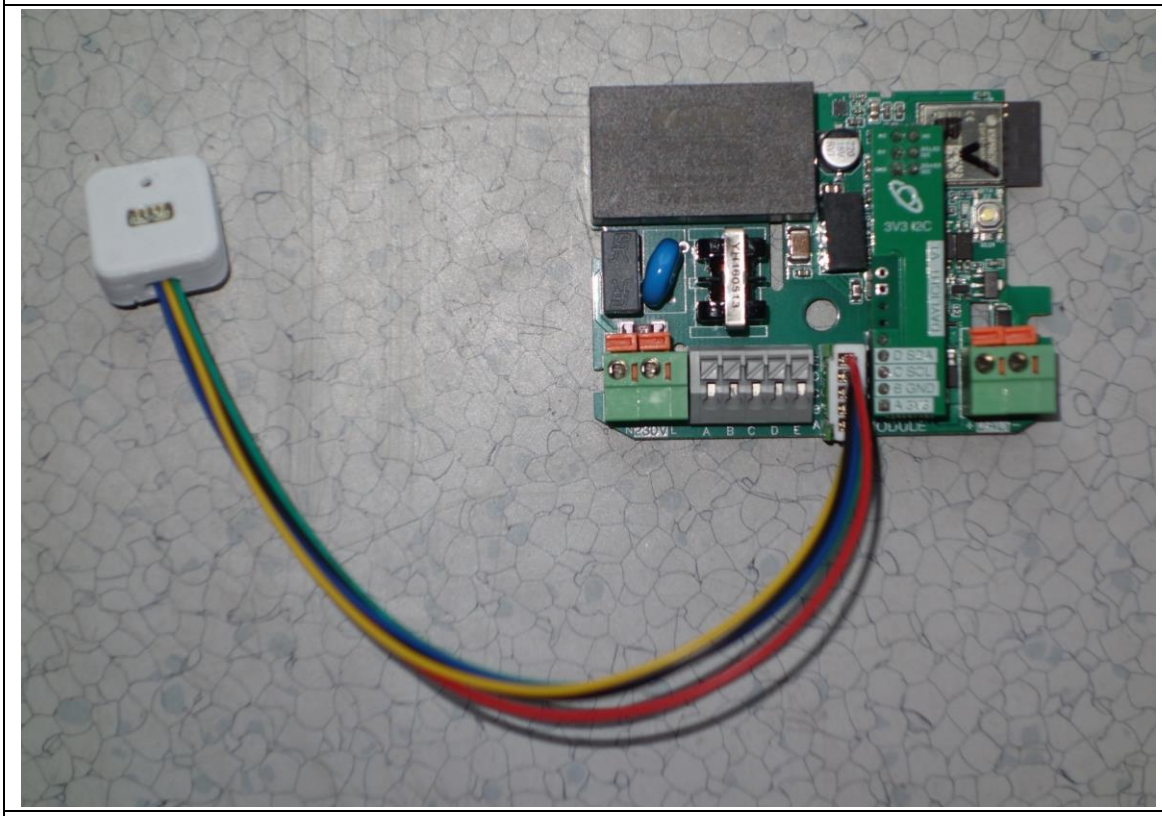
EUT #1	Industry Controller
Model name	SC Industry A6
Manufacturer	Spectoda (Light seekers s.r.o.)
Serial number	SPE10101A-X-IA-0400G
Photos:	



SPE10101A-X-IA-0400G

EUT label

EUT #2	Industry Controller with light sensor
Model name	
Manufacturer	Light seekers s.r.o.
Serial number	SPE10101A-D-IA-0400G
Photos:	



SPE10101A-D-IA-0400G

EUT label

EUT #2 only radiated emission test in range 30 MHz – 1 GHz. Not evaluated by a laboratory

4. Test Specification

4.1 Conducted Emission Measurement

Method	ČSN EN 55016-2-1 ed. 3, cl. 7		
Requirements	ČSN EN IEC 61000-6-3 ed. 3		
Frequency band	150 kHz – 30 MHz		
RBW	9 kHz		
Limits	Frequency range	QP Limit (Class B)	AV Limit (Class B)
	MHz	dBµV	dBµV
	0.15 to 0,5	66 to 56	56 to 46
	0.5 to 5	56	46
	5 to 30	60	50
EUT	#1		

4.2 Radiated Emission Measurement

Method	ČSN EN 55016-2-3 ed. 4, cl. 7.3		
Requirements	ČSN EN IEC 61000-6-3 ed. 3		
Frequency band	30 MHz – 1 GHz		
RBW	120 kHz		
Distance	3 m		
Limits	Frequency range	QP Limit (Class B)	
	MHz	dBµV/m	
	30 to 230	40	
	230 to 1 000	47	
EUT	#1, #2		

Method	ČSN EN 55016-2-3 ed. 4, cl. 7.6		
Requirements	ČSN EN IEC 61000-6-3 ed. 3		
Frequency band	1 GHz – 6 GHz		
RBW	1 MHz		
Distance	3 m		
Limits	Frequency range	PK Limit (Class B)	AV Limit (Class B)
	MHz	dBµV/m	dBµV/m
	1 000 to 3 000	70	50
	3 000 to 6 000	74	54
EUT	#1		

4.3 Radiated Electromagnetic Field Immunity Test

Method	ČSN EN IEC 61000-4-3, ed. 4	
Requirements	ČSN EN IEC 61547, ed. 3	
Test levels	3 V/m	80 MHz – 1 GHz
Modulation	AM, 80%, sinus, 1 kHz	
Frequency step	1 %	
Dwell time	1 s	
Polarization	vertical and horizontal	
Criterion	A	
EUT	#1	

4.4 Electrical Fast Transient/Burst Immunity Test

Method	ČSN EN 61000-4-4, ed. 3	
Requirements	ČSN EN IEC 61547, ed. 3	
Test levels	AC mains	1 kV, positive and negative
	Signal lines	0.5 kV, positive and negative
Test duration	1 min	
Transient shape	5 ns / 50 ns	
Burst duration	15 ms (5 kHz)	
Burst periode	300ms	
Coupling	AC mains	L, N, PE, L&N, L&PE, N&PE, L&N&PE
	Signal lines	Capacitive coupling clamp
Criterion	B	
EUT	#1	

4.5 Surge Immunity Test

Method	ČSN EN 61000-4-5, ed. 3	
Requirements	ČSN EN IEC 61547, ed. 3	
Test levels	AC mains	1 kV, wire to wire
		2 kV, wire to GND
	Signal lines	1 kV, wire to GND
Surge shape	1.2 µs / 50 µs	
Surge number	AC mains 90°	5 positive
	AC mains 270°	5 negative
	Signal lines	5 positive, 5 negative
Criterion	C	
EUT	#1	

4.6 Immunity to Conducted Disturbances, Induced by RF Fields

Method	ČSN EN IEC 61000-4-6, ed. 5	
Requirements	ČSN EN IEC 61547, ed. 3	
Test levels	3 V	0,15 MHz – 80 MHz
Modulation	AM, 80%, sinus, 1 kHz	
Frequency step	1 %	
Dwell time	1 s	
Impedance	150 Ω	
Criterion	A	
EUT	#1	

4.7 Voltage Dips and Short Interruptions

Method	ČSN EN IEC 61000-4-11, ed. 3	
Requirements	ČSN EN IEC 61547, ed. 3	
Voltage dips	Level	70 %
	Duration	10 periods
	Criterion	C
Short interruption	Level	0 %
	Duration	0.5 period
	Criterion	B
EUT	#1	

4.8 Criteria

Criterion	Description
A	During the test, no change in luminance may be observed and, if there is control regulation, it must work as intended during the test.
B	During the test, the luminance can change to any value. After the test, the luminance must be restored to its original value within one minute. The regulation may not be functional during the test, but after the test the control must work in the same mode as before the test, provided that no command to change the mode was issued during the test.
C	During and after the test, any change in luminance is allowed and the light source may stop shining. After the test, all functions must be restored within 30 minutes; if necessary, also by short-term drying of the mains supply or by means of control regulation.

5. Environmental Conditions During Tests

Dates:	11 – 13 November 2024
Temperature:	Between 19°C and 22°C
Relative Humidity:	Between 27 % rH and 32 % rH

6. Test Equipment

6.1 Conducted Emission Measurement Equipment

ID	Equipment	Calibration valid until:
NZ2/010	EMC chamber SAC	-
PM2/001	EMI receiver N9038A	13 May 2025
PM2/085	V-LISN NSLK 8122RC	12 September 2025
PM2/106	Cable set	19 December 2024
PM2/096	Temperature, Humidity Data Logger S3120E	10 June 2025

* Last cable check date – 3 July 2024

6.2 Radiated Emission Measurement Equipment

ID	Equipment	Calibration valid until:
NZ2/010	EMC chamber SAC	-
PM2/001	EMI receiver N9038A	13 May 2025
PM2/003	Antenna ETS 3142E	28 February 2026
PM2/105	Antenna preamplifier BBV 9743B	15 January 2026
PM2/106	Cable set	19 December 2024
PM2/096	Temperature, Humidity Data Logger S3120E	10 June 2025

* Last cable check date – 3 July 2024

6.3 Radiated Electromagnetic Field Immunity Test Equipment

ID	Equipment	Calibration valid until:
NZ2/010	EMC chamber SAC	-
PM2/002	Generator N5183B	19 June 2026
PM2/003	Antenna ETS 3142E	28 February 2026
PM2/005	Probe FL7218	11 July 2025
PM2/006	Power meter PM2003	14 May 2025
PM2/008	Measuring probe PH2004A	15 May 2025
PM2/009	Measuring probe PH2004A	15 May 2025
NZ2/071	Amplifier VLC-290	-
NZ2/022	Amplifier 200S1G6	-
NZ2/043	Directional coupler DC2036A	-
PM2/106	Cable set	19 December 2024
PM2/096	Temperature, Humidity Data Logger S3120E	10 June 2025

6.4 Electrical Fast Transient/Burst Immunity Test Equipment

ID	Equipment	Calibration valid until:
PM2/052	Generator TRA3000 – module EXT-TRA3000F	12 September 2025
PM2/095	Temperature and humidity sensor T7610	17 May 2025
TPR2_CN_EFT1000	Capacitive coupling clam	-

6.5 Surge Immunity Test Equipment

ID	Equipment	Calibration valid until:
PM2/053	Generator TRA3000 – module EXT-TRA3000S	12 September 2025
PM2/095	Temperature and humidity sensor T7610	17 May 2025
NZ2/058	PSU EMC Partner PS3	-

6.6 Immunity to Conducted Disturbances Test Equipment

ID	Equipment	Calibration valid until:
PM2/068		
NZ2/025		
NZ2/050		
PM2/070		
PM2/076		
PM2/095	Temperature and humidity sensor T7610	17 May 2025

6.7 Voltage Dips and Short Interruptions Test Equipment

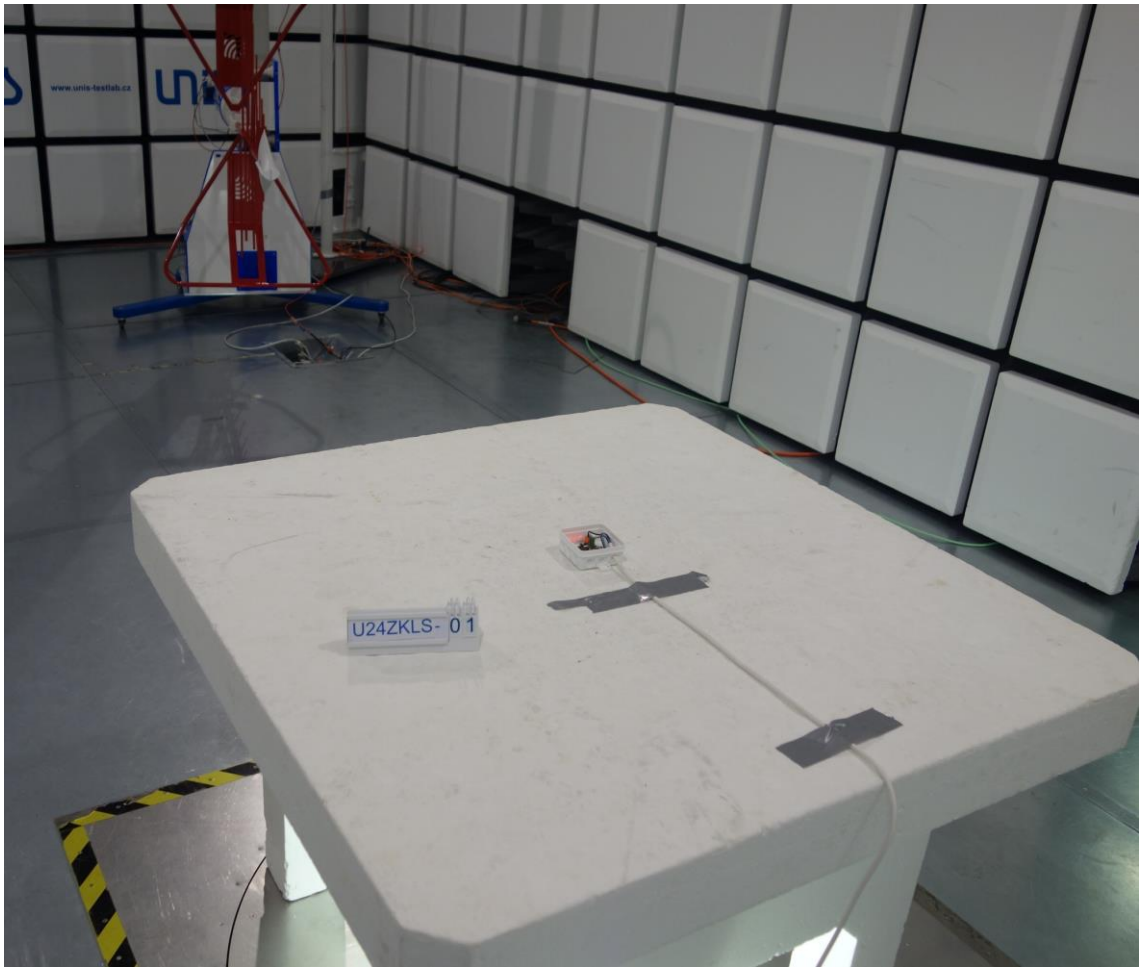
ID	Equipment	Calibration valid until:
PM2/054	Generator TRA3000 – module EXT-TRA3000D	12 September 2025
PM2/055	Module EXT-TRA3000V	
PM2/095	Temperature and humidity sensor T7610	17 May 2025

7. Test Setup

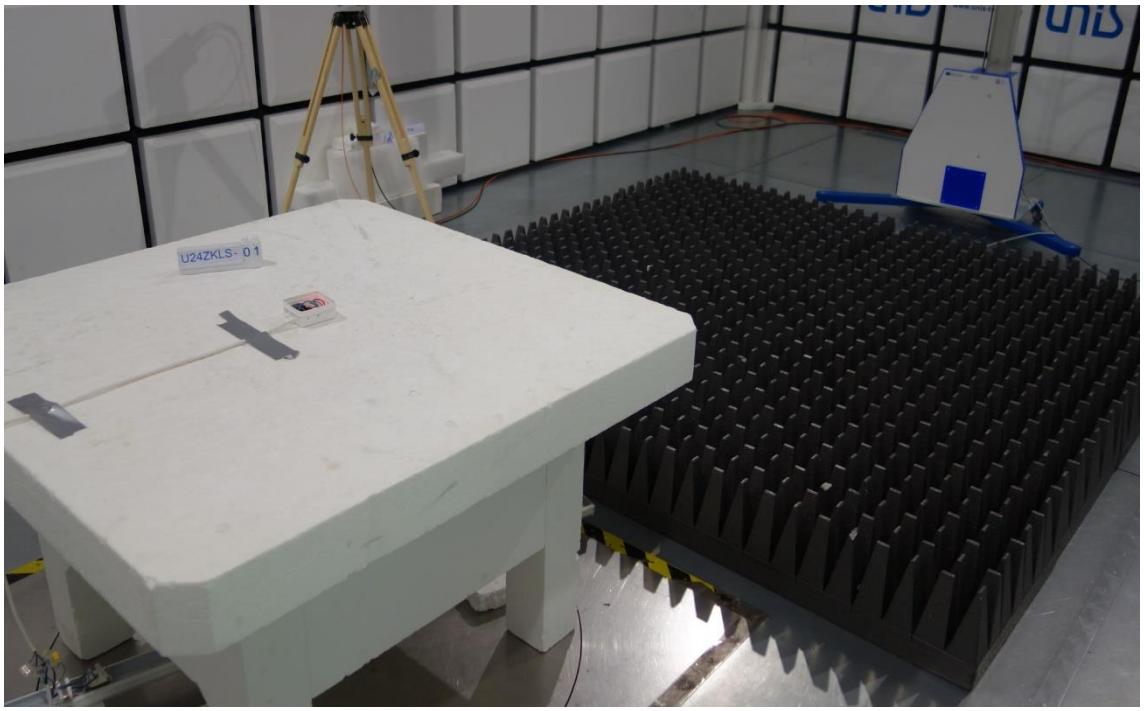
7.1 Conducted Emission Measurement

CE setup

7.2 Radiated Emission Measurement



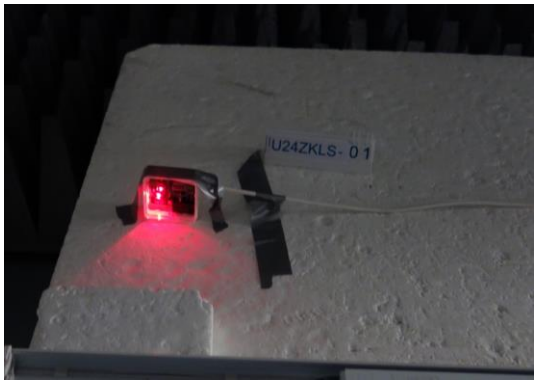
Radiated emission 80 MHz – 1 GHz set-up



Radiated emission 1 GHz – 6 GHz set-up

7.3 Radiated Electromagnetic Field Immunity Test

Position 1



Position 2

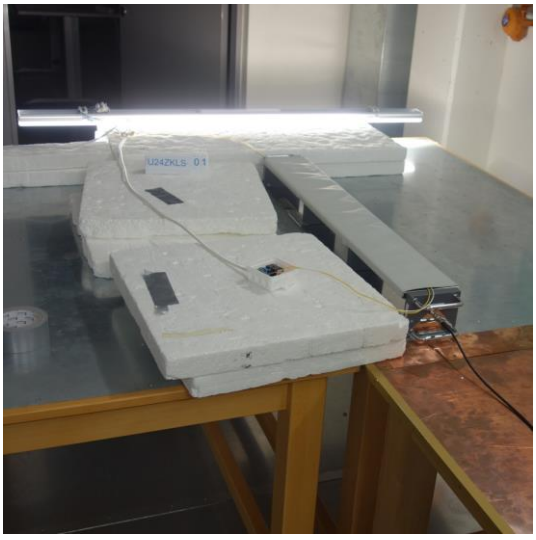
Position 3

Position 4

Oriented towards the antenna

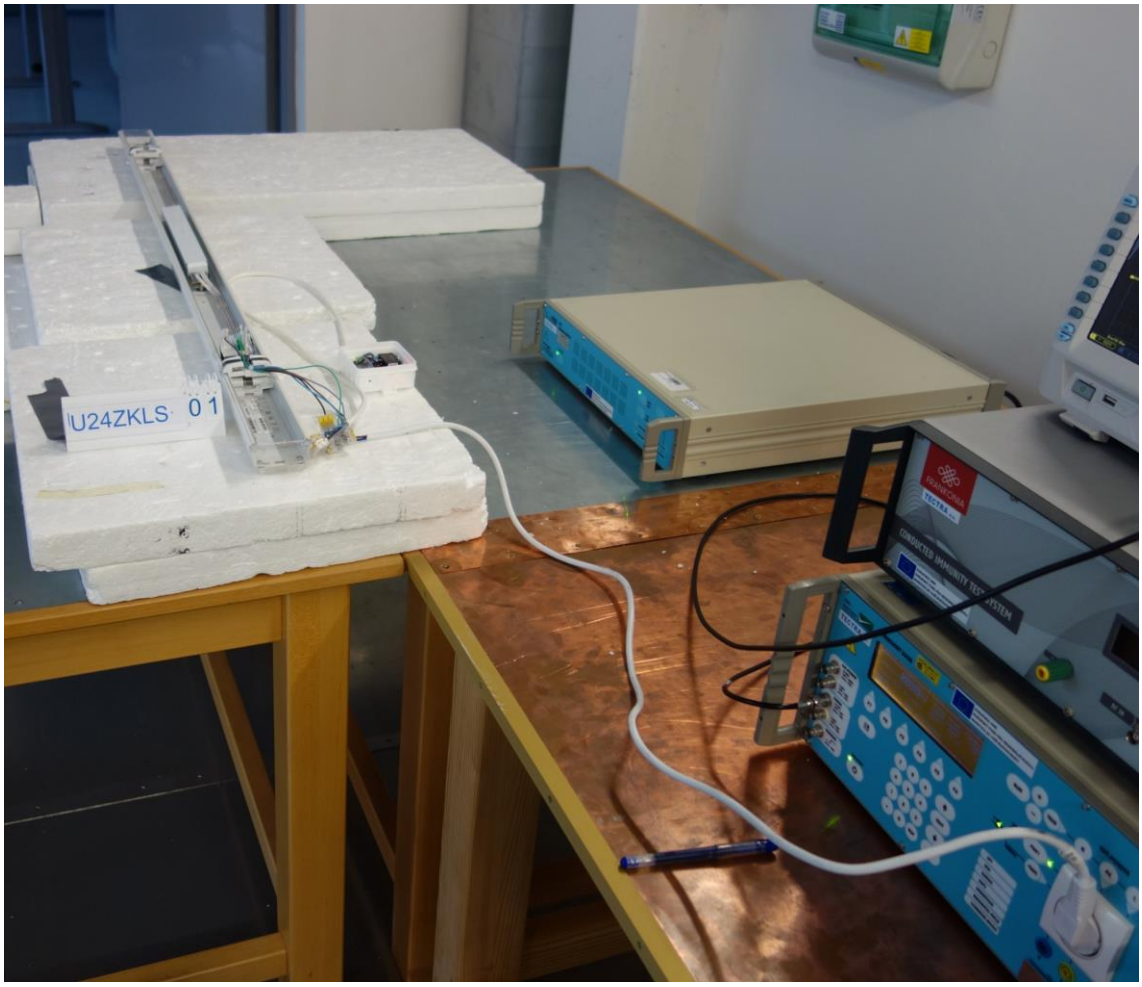
7.4 Electrical Fast Transient/Burst Immunity Test

AC supply test



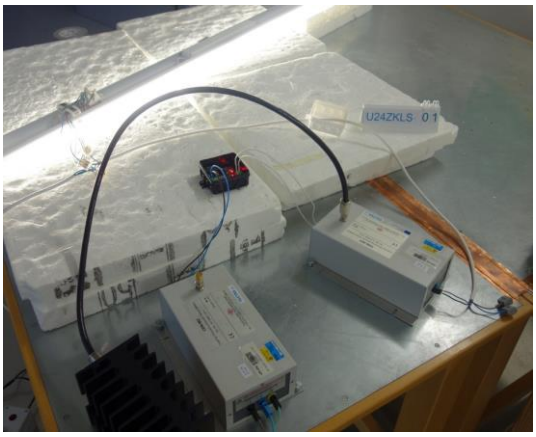
DALI line test

7.5 Surge Immunity Test and Voltage Dips and Short Interruptions Setup

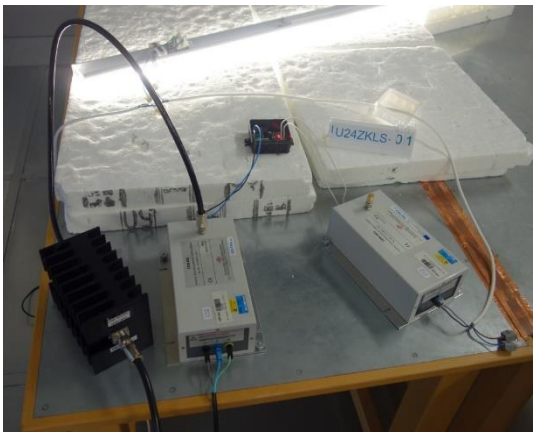


Surge test setup, voltage dips setup, short interruptions setup

7.6 Immunity to Conducted Disturbances, Induces by RF Fields Setup



DALI line test

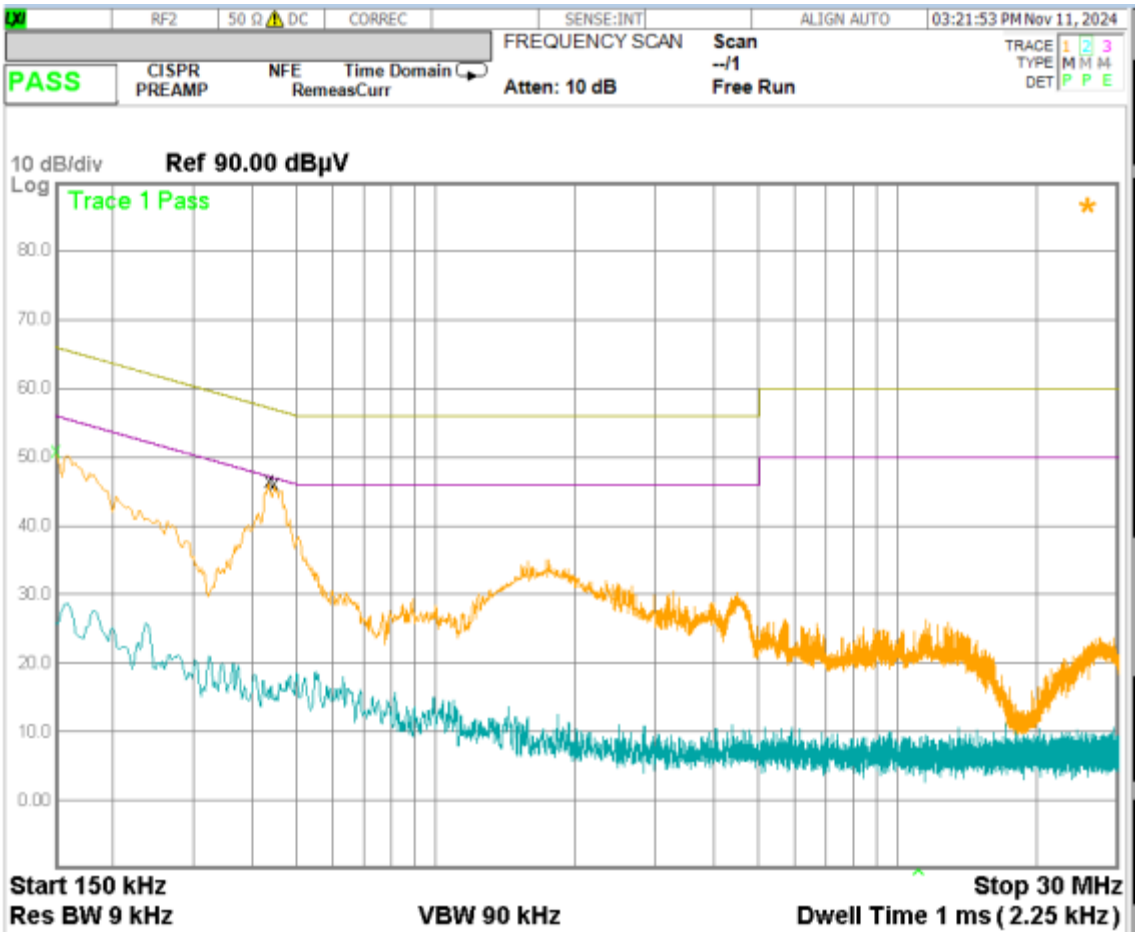


AC mains tests

8. Test Records

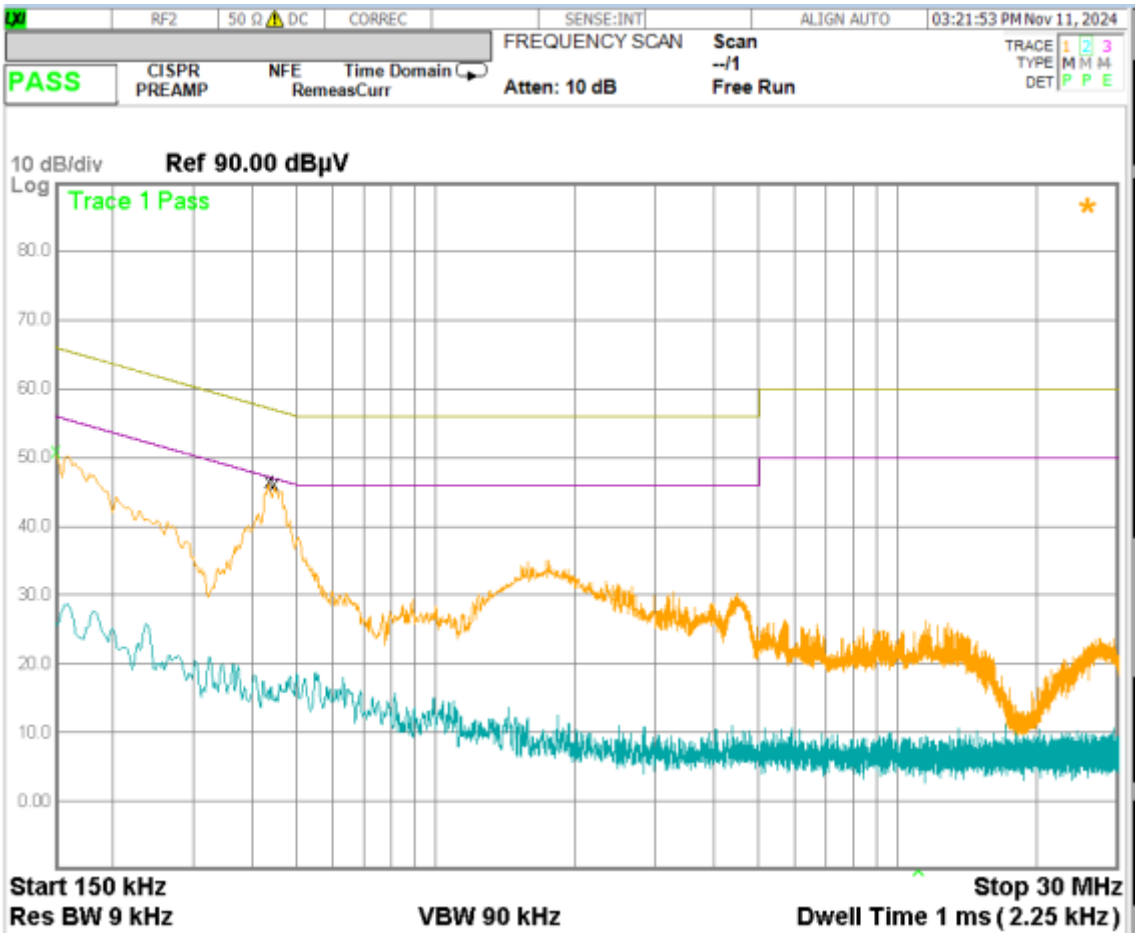
8.1 Conducted Emission Measurement

EUT #1	Measurement 1	
	TOP GRAPH	
Frequency band	150 kHz to 30 MHz	
Wire	L	



Frequency	QP	QP to limit	AV	AV to limit	Result
MHz	dBµV	dB	dBµV	dB	
0.150 00	40.7	-25.3	22.3	-33.7	Pass
0.433 50	37.3	-19.9	20.6	-26.6	Pass
0.470 00	35.9	-21.1	17.9	-29,1	Pass
TOP GRAPH					
Trace 1 – measured with PK detector Trace 2 – background					
The expanded measurement uncertainty is 3.4 dB for 150 kHz – 30 MHz					

EUT #1	Measurement 2	
	TOP GRAPH	
Frequency band	150 kHz to 30 MHz	
Wire	N	

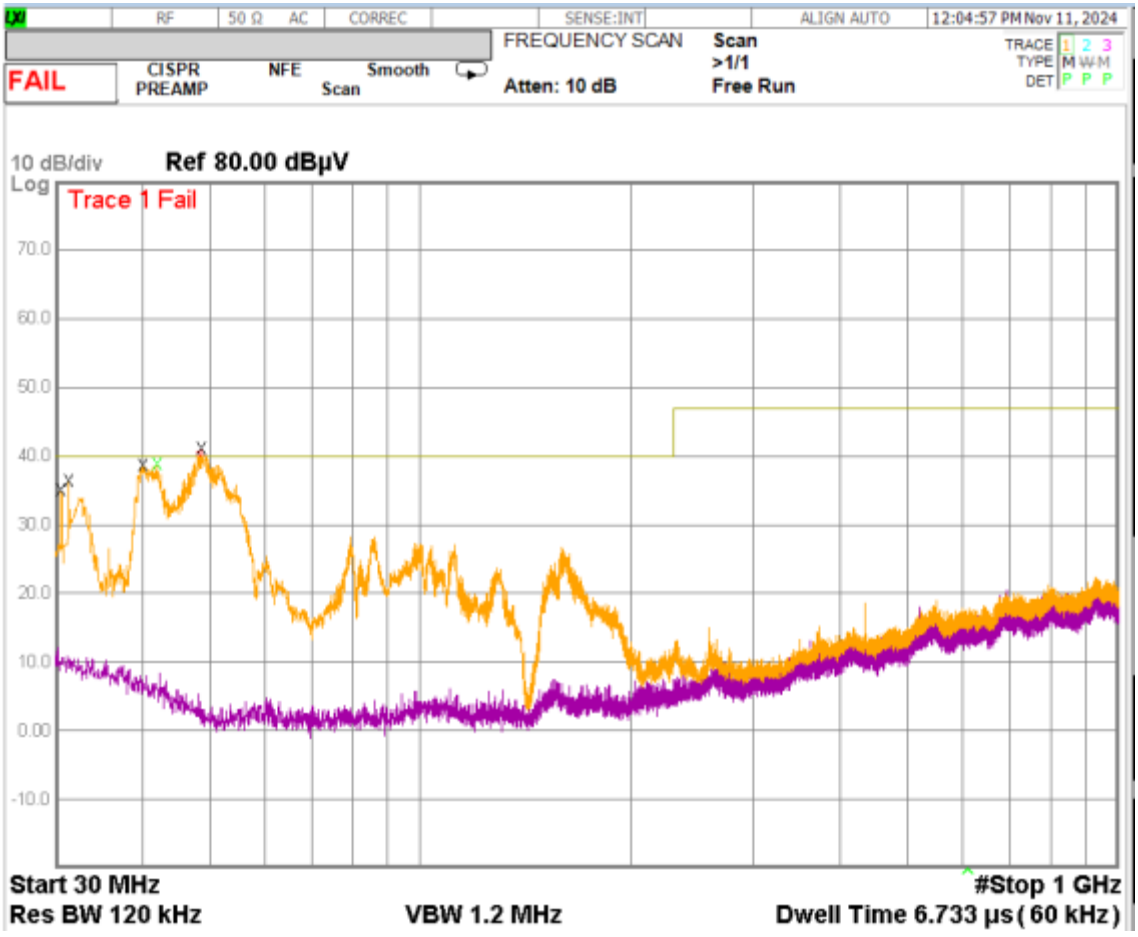


Frequency	QP	QP to limit	AV	AV to limit	Result
MHz	dBµV	dB	dBµV	dB	
0.150 00	41.6	-24.4	23.0	-33.0	Pass
0.177 00	38.4	-26.2	21.0	-33.6	Pass
0.451 50	39.0	-17.8	22.8	-24.0	Pass

TOP GRAPH	
Trace 1 – measured with PK detector Trace 2 – background	
The expanded measurement uncertainty is 3.4 dB for 150 kHz – 30 MHz	

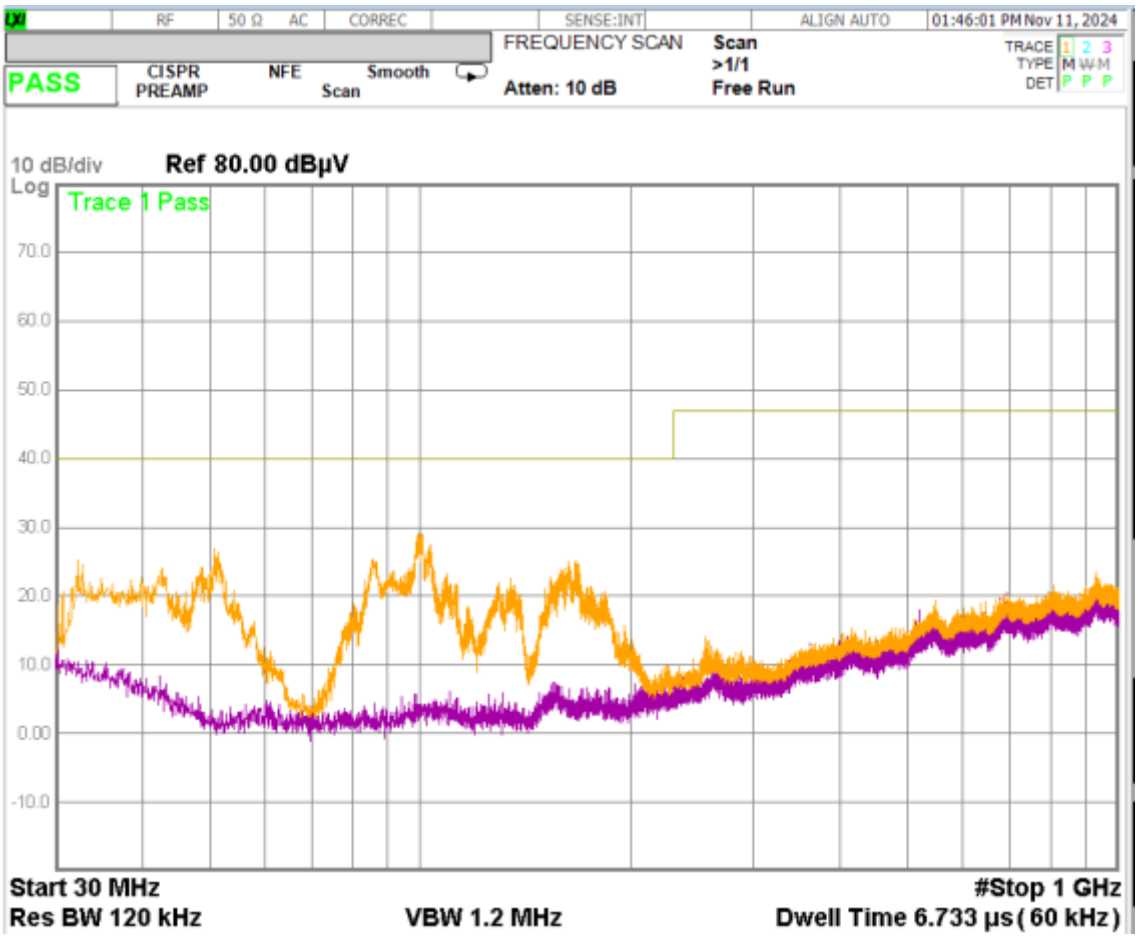
8.2 Radiated Emission Measurement

EUT #1	Measurement 1	
	TOP GRAPH	
Frequency band	30 MHz – 1 GHz	
Antenna polarization	Vertical	



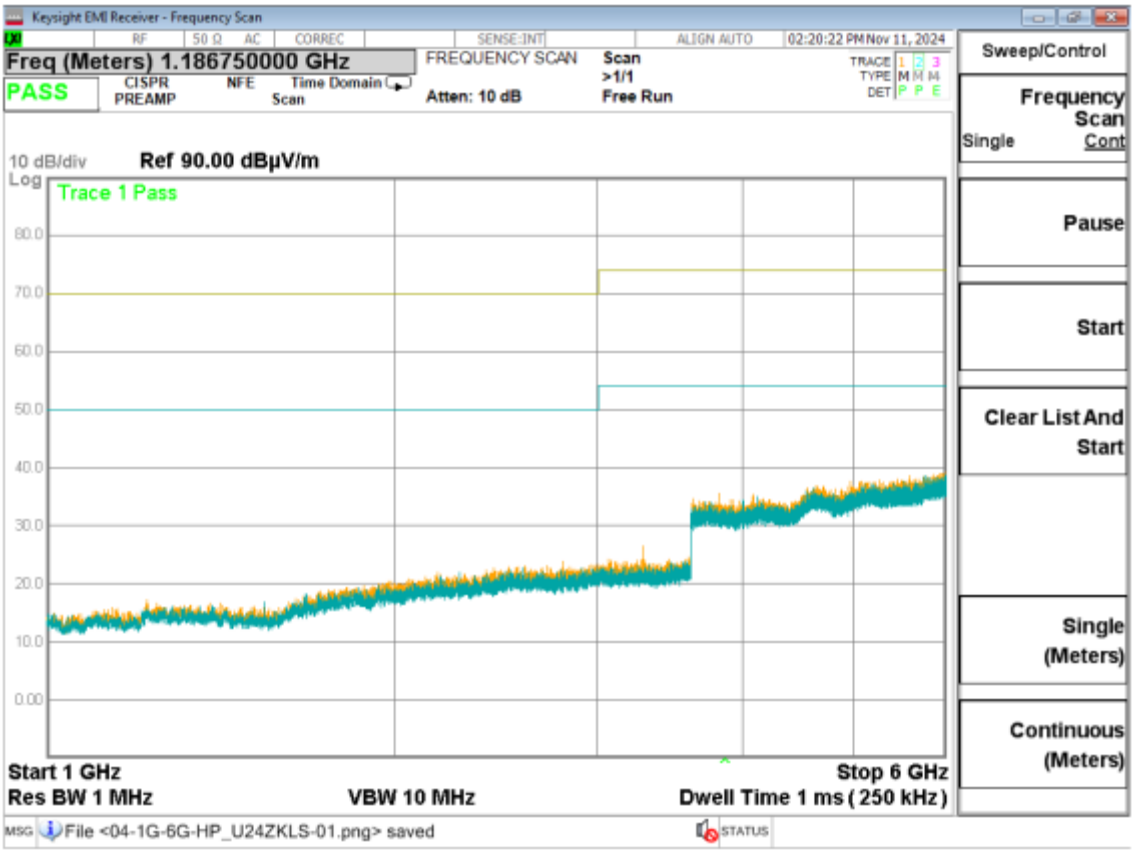
Frequency	Orientation	Antenna height	QP	QP to limit	Result
MHz		m	dBµV/m	dB	
30.540	No directivity	1	23.6	-16.4	Pass
31.320	No directivity	1	26.1	-13.9	Pass
39.960	No directivity	1	34.0	-6.0	Pass
41.880	No directivity	1	32.7	-7.3	Pass
48.601	No directivity	1	35.6	-4.4	Pass
TOP GRAPH					
Trace 2 – measured with PK detector					
The expanded measurement uncertainty is 5.9 dB for 30 MHz – 200 MHz 5.3 for 200 MHz – 1 GHz					

EUT #1	Measurement 2	
	TOP GRAPH	
Frequency band	30 MHz – 1 GHz	
Antenna polarization	Horizontal	



Frequency	Orientation	Antenna height	QP	QP to limit	Result
MHz		m	dBµV/m	dB	-
32.280	no directivity	2	16.6	-23.4	Pass
50.641	120°	3	21.0	-19.0	Pass
100.20	280°	3	25.6	-14.4	Pass
166.87	110°	2	19.5	-20.5	Pass
TOP GRAPH					
Trace 2 – measured with PK detector					
The expanded measurement uncertainty is 5.9 dB for 30 MHz – 200 MHz 5.3 for 200 MHz – 1 GHz					

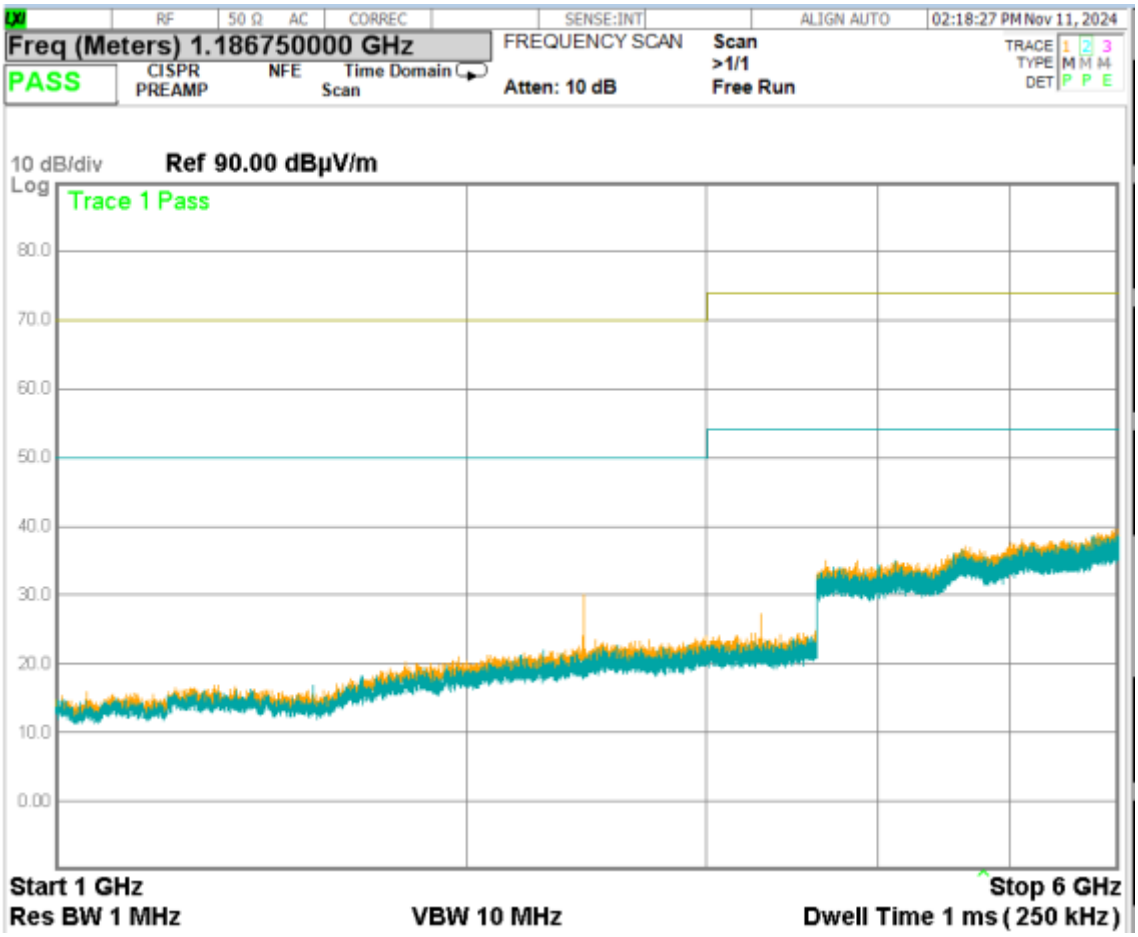
EUT #1	Measurement 3	
	TOP GRAPH	
Frequency band	30 MHz – 1 GHz	
Antenna polarization	Vertical	



TOP GRAPH	
Trace 2 – measured with PK detector	

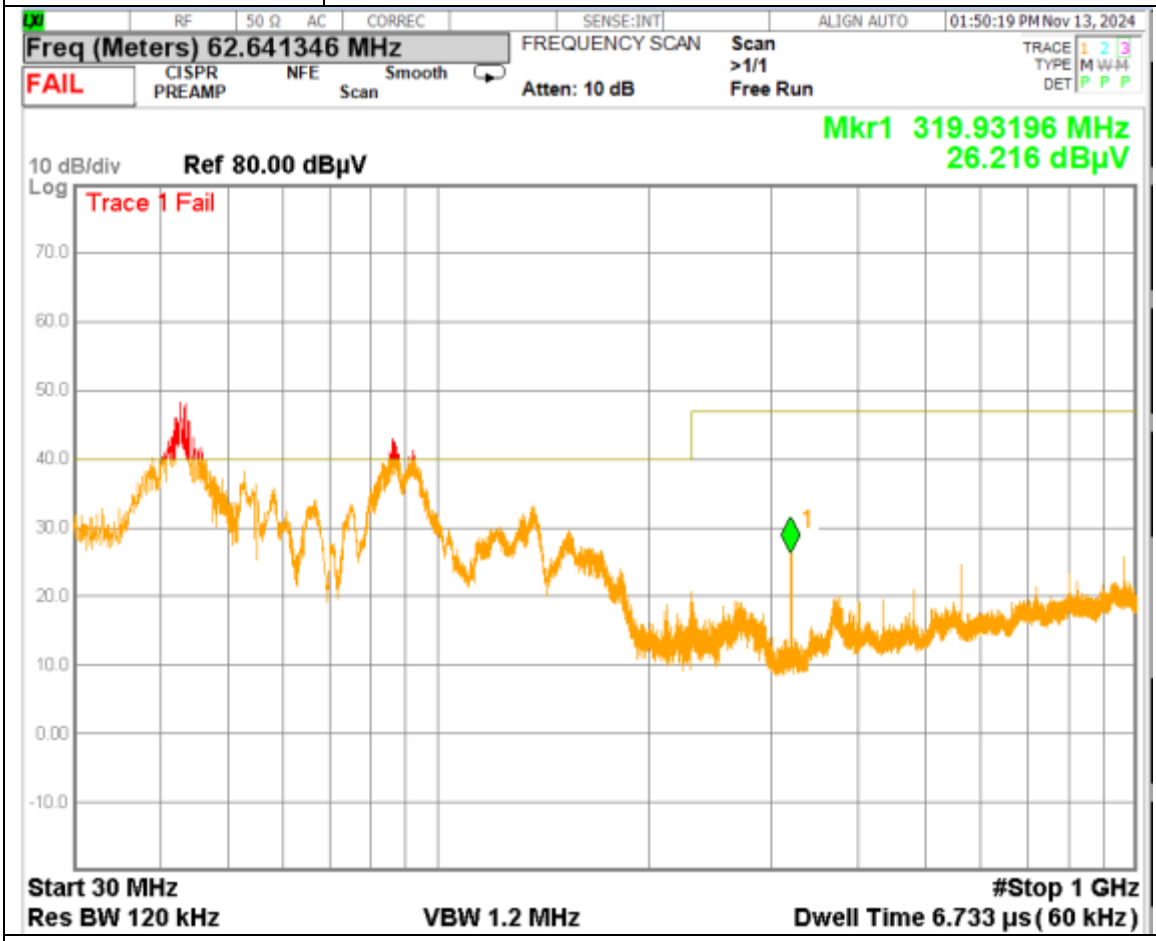
The expanded measurement uncertainty is 5.9 dB for 30 MHz – 200 MHz
5.3 for 200 MHz – 1 GHz

EUT #1	Measurement 4	
	TOP GRAPH	
Frequency band	1 GHz – 6 GHz	
Antenna polarization	Horizontal	



TOP GRAPH	
Trace 2 – measured with PK detector	
The expanded measurement uncertainty is 4.3 dB for 1 GHz – 6 GHz	

EUT #2	Measurement 5	
	TOP GRAPH	
Frequency band	30 MHz – 1 GHz	
Antenna polarization	Vertical	
Configuration	EUT with light sensor	



TOP GRAPH	
Trace 2 – measured with PK detector	

The expanded measurement uncertainty is 5.9 dB for 30 MHz – 200 MHz
5.3 for 200 MHz – 1 GHz

EUT 103	Measurement 6	
	TOP GRAPH	
Frequency band	30 MHz – 1 GHz	
Antenna polarization	Horizontal	
Configuration	EUT with light sensor	

TOP GRAPH	
Trace 2 – measured with PK detector	

The expanded measurement uncertainty is 5.9 dB for 30 MHz – 200 MHz
5.3 for 200 MHz – 1 GHz

8.1 Radiated Electromagnetic Field Immunity Test

EUT	#1			
Method	ČSN EN IEC 61000-4-3, ed. 4			
Requirements	ČSN EN IEC 61547, ed. 3			
Criterion	A			
Frequency range	80 MHz – 1 GHz			
Test level	3V/m			
Configuration	Light on			
Table orientation	0°	90°	180°	270°
Vertical polarization	A	A	A	A
Horizontal polarization	A	A	A	A

8.2 Electrical Fast Transient/Burst Immunity Test

EUT	#1			
Method	ČSN EN 61000-4-4, ed. 3			
Requirements	ČSN EN IEC 61547, ed. 3			
Criterion	B			
Wire	Coupling	Level	Positive polarity	Negative polarity
L (AC supply)	direct	0.5 kV	A	A
N (AC supply)			A	A
PE (AC supply)			A	A
L+N (AC supply)			A	A
L+PE (AC supply)			A	A
N+PE (AC supply)			A	A
L+N+PE (AC supply)			A	A
L (AC supply)	direct	1 kV	A	A
N (AC supply)			A	A
PE (AC supply)			A	A
L+N (AC supply)			A	A
L+PE (AC supply)			A	A
N+PE (AC supply)			A	A
L+N+PE (AC supply)			A	A
DALI	Capacitive coupling clamp	0.5 kV	A	A

8.3 Surge Immunity Test

EUT	#1		
Method	ČSN EN 61000-4-5, ed. 3		
Requirements	ČSN EN IEC 61547, ed. 3		
Criterion	C		
Wire combination	Level		
		Positive pulses / 90°	Negative pulses / 270°
Between L and N	0.5 kV	A	A
Between L and N	1 kV	A	A
Between L and PE	0.5 kV	A	A
Between L and PE	1 kV	A	A
Between L and PE	2 kV	A	A
Between N and PE	0.5 kV	A	A
Between N and PE	1 kV	A	A
Between N and PE	2 kV	A	A

8.4 Immunity to Conducted Disturbances, Induced by RF Fields

EUT	#1		
Method	ČSN EN IEC 61000-4-6, ed. 5		
Requirements	ČSN EN IEC 61547, ed. 3		
Criterion	A		
Cable	Coupling	Level	Result
AC mains	CDN M2	3 V	A
DALI	CDN AF2	3 V	A

8.5 Voltage Dips and Short Interruptions

EUT	#1			
Method	ČSN EN IEC 61000-4-11, ed. 3			
Requirements	ČSN EN IEC 61547, ed. 3			
Test	Criterion	Level	Duration	Result
Voltage dips	C	70 %	10 periods	A
Short interruption	B	0 %	0.5 period	B

9. Test Evaluation

The test laboratory evaluates the results of the tests stating that the EUT:

Controller SC Industry A6, S/N SPE10101A-X-IA-0400G

passed / failed the test criteria as given in the following table:

EMC Test Name	Test Method	Test Requirements	Evaluation
Conducted emission measurement	ČSN EN 55016-2-1 ed. 3, cl. 7	ČSN EN IEC 61000-6-3 ed. 3	Passed*
Radiated emission measurement	ČSN EN 55016-2-3 ed. 4, cl. 7.3		Passed*
Radiated Field Immunity	ČSN EN IEC 61000-4-3, ed. 4	ČSN EN IEC 61547, ed. 3 Standard is not within the scope of accreditation	Passed
EFT/Burst Immunity	ČSN EN 61000-4-4, ed. 3		Passed
Surge Immunity	ČSN EN 6100-4-5, ed. 3		Passed
Immunity to conducted disturbances induced by RF fields	ČSN EN IEC 61000-4-6, ed. 5		Passed
Voltage dips	ČSN EN IEC 61000-4-11, ed. 3		Passed
Short interruption			Passed

*Evaluation of limits is given by norm ČSN EN 55016-4-2 ed.2.

10. Additional information

The expanded measurement uncertainty is determined as the product of the combined standard measurement uncertainty and a coverage factor k = 2, which approximately corresponds to a 95% confidence level for a normal distribution.

End of Test Report